

No special nerve-fibres could be detected passing to these pigmented grooves. Nerves passing to the eye of *Patella* were also wanting; while, on the other hand, distinct veins were found passing to the eye of *Haliotis* and *Fissurella*.

He further stated that this power of distinguishing a shadow would be of great use to the animal in the struggle for existence. The *Solen* lies buried perpendicularly in the sand, and allows the siphon to project a little above the surface. This projecting part would, probably, frequently be bitten off by fishes, were it not for the fact that the shadow of the enemy would give warning, so that the siphon could be withdrawn in time to save it from destruction. —*Proc. Acad. Nat. Sci. Philad.*, Nov. 6, 1883, p. 248.

*On a Nematode Parasitic on the Common Onion.*

By M. JOANNES CHATIN.

It is well known that the parasitism of the Nematoda is exerted not only at the expense of animals, a certain number of these worms attacking various plants, in which they give rise to more or less serious alterations. The *Anguillula* of mildewed wheat has been very long known; an allied species, parasitic on the coffee-tree, has been studied by M. C. Jobert; and other worms belonging to the same group are observed in Dipsacæ, Mosses, &c., as I took occasion to state in a communication dating some years back.

The worm which forms the subject of the present note lives as a parasite in the common onion (*Allium Cepa*, Linn.), and becomes in it the cause of a disease of which I have been able to trace the different phases, thanks to the extreme kindness of M. Pasteur, who sent me, in May 1881, a portion of a bulb infested by these Nematodes. I have been compelled to defer the publication of the results of my researches on account of the time necessary for tracing the development and the mode of propagation of the worm, appreciating exactly its vital resistance &c. Even now I shall confine myself to a summary of the principal points of its history; the anatomical and embryogenic details &c. must find a place in a more extended work.

By its general characters and especially the construction of its digestive tube, as also by the organization of its reproductive apparatus, the *Anguillula* of the onion must be classed in the great genus *Tylenchus*, and every thing authorizes our thinking that it represents a species distinct from those which have hitherto been described.

It is in the larval state that the worm penetrates into the bulb, which it attacks at the level of the "fundamental axis;" then it spreads into the roots and to the base of the flowering stem, generally respecting the external tissues, but completely disorganizing the central tissue, even getting into the fibro-vascular bundles and reducing them to a brownish pultaceous mass, in which nothing but a few fragments of spiral vessels is soon to be observed.

The *Anguillula* then attains its full development, the sexual organs, sketched out in the larva, rapidly complete their formation; fecundation takes place; and from the ova issue the young claviform larvæ, which are speedily set free by the disaggregation of the bulb. They creep about in the surrounding soil, that is, if the latter is sufficiently damp; in the contrary case they remain dried up and in a state of latent vitality, until the moment when favourable conditions permit them to revert to active life. On arriving in the neighbourhood of a normally developed *Allium* they penetrate into it, as above stated, and the cycle recommences.

In this way is explained how the same bulb contains at the same time adults, ova, and larvæ, and also how the parasite can be transmitted with the greatest facility from one plant to another, and how it is rapidly propagated through a whole plantation. As to the propagation through the floral organs &c., this is rare, the *Anguillula* only attaining them with difficulty, and this, indeed, precisely on account of the initial injuries which it causes in the bulb, and the effect of which is to arrest the development of the flowering-stem or to dry it up quickly.

The larvæ present a faculty of revivification analogous to that observed in the larvæ of the *Anguillula* of mildewed wheat; but it would seem that here this faculty is less powerful. I have, however, been able to ascertain it in larvæ preserved for twenty-six months in a dry well-corked bottle; beyond this period I have only obtained negative results. The adult *Anguillulæ*, subjected to desiccation, perish quickly, as is also the case when they are exposed to a cold of  $-10^{\circ}$  ( $=14^{\circ}$  F.), which has no action on the larvæ. Acidulated water and dilute alcohol instantly kill the adults, while the larvæ retain their vitality in them for some time.

These facts are obviously comparable to those observed in the case of the *Anguillula* of mildewed wheat, but the onion-parasite constantly manifests a smaller vital resistance. There is only one exception to be made in this particular:—M. Davaine has shown that the *Anguillula* of the mildewed wheat when introduced into the digestive canal of fishes, batrachians, and reptiles remains intact, whereas if the experiment be repeated with birds or Mammalia the worm is soon digested. Now the *Anguillula* of the onion does not undergo any alteration in this same medium, and is to be met with again, distinctly characterized, either in the dejections or in the contents of the intestine, if the animal has been killed shortly after the ingestion of portions of the plants containing the worms. One might thus be exposed to the error of regarding them as true parasites of the host into which they have been accidentally introduced, and in which they cannot acquire any development or undergo any encystation, as I have clearly ascertained.

The agents employed against the *Anguillula* of mildewed wheat may be used against the parasite of the onion; but the most efficacious process consists in pulling up the diseased plants and burning them.—*Comptes Rendus*, December 24, 1883, p. 1503.